

---

K251

# Synchronous machines training

## COURSE DESCRIPTION

### Course goal

The goal of the course is to give the participants a general understanding of

- large electrical machines and their applications
- basic mechanical and electrical theory of electrical machines

### Learning objectives

Upon completion of this course, students will be able to:

- explain the basics of large rotating electrical machines, electrically as well as mechanically
- describe how the machines are functioning in relation to control equipment
- present some motor and generator applications
- explain what the main features of machines from ABB Machines in Västerås are
- explain after sales service and maintenance issues with regards to these machines

### Participant profile

This training is mainly intended for external customers, but also for ABB employees and others with an interest in large electrical machines.

### Course fee

The participant's fee is 1500-€. Travel and accommodation should also be covered by the participant.

### Topics

- Overview of Motors and Generators product portfolio
- Electrical machines – theory
- Electrical machines – mechanical design
- Hazardous area design
- Theory of synchronous machines
- Comparison of Induction and synchronous machines
- Commissioning
- Control panels for synchronous machines
- Motor starting
- Vibration in large AC machines
- Electrical insulation theory
- Life cycle management
- Guided workshop tour
- Test room (3 stations x 30 min)

### Training type and methods

This is an instructor led training with visits to the factory. The training material and lectures will be in English.

### Course duration

The duration is 3 days.

### ABB Training

[ABB Training- ABB Service for Motors and Generators](#)

---

## Agenda (estimated)

<b>Day 1</b>	<b>Topics</b>
8:30	Introduction and practical details
8:45	Sustainability
9:15	Overview of Motors and Generators product portfolio
9:45	Coffee
9:55	Electrical machines – theory
10:40	Break
10:50	ABB 4-6 pole Synchronous Machines
11:25	Lunch
12:25	Guided workshop tour
13:55	Coffee
14:10	Electrical machines – mechanical design
14:50	Coffee
15:00	Electrical machines – mechanical design (continuing)
15:50	Hazardous area design
16:30	End of day
18:00	Activity
<b>Day 2</b>	<b>Topics</b>
08:20	Start of the day
08:25	Synchronous condensers
9:00	Electrical insulation theory
10:00	Coffee
10:15	Vibrations in large AC machines
11:00	Break
11:15	Motor starting
11:55	Lunch
12:55	Motor starting (continuing)
13:35	Break
13:45	Control panels for synchronous machines
14:25	Break
14:35	Control panels for synchronous machines (continuing)

15:05	Coffee
15:15	MCP and mounting of machine
16:50	End of day
<b>Day 3</b>	<b>Topics</b>
8:50	Start of the day
8:55	Testing
9:20	Break
9:30	Commissioning
10:30	Coffee
10:45	Life cycle management
11:45	Lunch
12:45	Hazardous Area Design
13:25	Break
13:35	Summary
14:10	End of day